AMENDMENTS TO THE CLAIMS

1-20. (Canceled)

21. (Currently Amended) A pixel signal processing apparatus that, given a group of pixel signals from pixels arrayed on a two-dimensional plane, each pixel having one of a first to an N-th spectral characteristic, generates a pixel signal having an L-th spectral characteristic at a ~~first~~ pixel position of interest where there is a pixel signal having a K-th spectral characteristic (K and L being different integers between 1 and N, inclusive), comprising:

a selector for selecting one of the arrayed pixels for the pixel position of interest;

low-pass filters corresponding to the K-th spectral characteristic and the L-th spectral characteristic, respectively, the low-pass filters processing a plurality of pixel positions in an area neighboring the pixel position of interest;

a regression analysis device ~~means~~ for performing a regression analysis in a plurality of pixel positions in ~~an~~ the area neighboring the ~~first~~ pixel position of interest, using the pixel signals or outputs of the low-pass filter corresponding to ~~having~~ the K-th spectral characteristic as an explanatory variable and the pixel signals or outputs of the low-pass filter corresponding to ~~having~~ the L-th spectral characteristic as a purpose variable, to calculate a regression line,

$$y = a \cdot x + b \qquad \text{...(1)}$$

('y' being the pixel signal having the L-th spectral characteristic, 'x' being the pixel signals having the ~~L-th~~ K-th spectral characteristic, 'a' and 'b' being constants representing the slope

and intercept of the regression line),

expressing a correlation of the pixel signals having the K-th spectral characteristic with the pixel signals having the L-th spectral characteristic; and

a calculating device ~~means~~ for determining the pixel signal having the L-th spectral characteristic at the first pixel position of interest by applying a conversion formula based on the regression line to the pixel signal having the K-th spectral characteristic at the ~~first~~ pixel position of interest, ~~; and~~

wherein the ~~a~~ selector ~~ion means for~~ sequentially selects ~~ing~~ different ones of the arrayed pixels ~~as~~ for the pixel position of interest and, for each selected pixel position of interest, using the regression analysis device ~~means~~ and the calculating device ~~means~~ to determine the pixel signal having the L-th spectral characteristic.

22. (Currently Amended) The pixel signal processing apparatus of claim 21, further comprising an imaging device with N types of photoelectric conversion elements, each having one of the first to N-th spectral characteristics, arrayed on a two-dimensional plane, wherein:

the selector ~~ion means~~ determines the K-th and L-th spectral characteristics in order of the strength of the correlation between their spectral characteristics.

23. (Currently Amended) The pixel signal processing apparatus of claim 22, wherein:

the imaging device has one of red (R), green (G), and blue (B) spectral characteristics;

the selector causes the image processing apparatus to perform the following sequence of operations: ~~ion means~~

first, determine as the L-th spectral characteristic ~~s~~ the green pixel signals at pixel positions where red pixel signals are present and the green pixel signals at pixel positions where blue pixel signals are present;

next, ~~the selection means~~ determine as the L-th spectral characteristic ~~s~~ the red pixel signals at pixel positions where green pixel signals are present and the blue pixel signals at pixel positions where green pixel signals are present; and

finally, ~~the selection means first~~ determine as the L-th spectral characteristic ~~s~~ the blue pixel signals at pixel positions where red pixel signals are present and the red pixel signals at pixel positions where blue pixel signals are present.

24. (Currently Amended) A pixel signal processing method that, given a group of pixel signals from pixels arrayed on a two-dimensional plane, each pixel having one of a first to an N-th spectral characteristic, generates a pixel signal having an L-th spectral characteristic at a ~~first~~ pixel position of interest where there is a pixel signal having a K-th spectral characteristic (K and L being different integers between 1 and N, inclusive), comprising:

selecting one of the arrayed pixels for the pixel position of interest;

applying low-pass filtering to a plurality of pixel positions in an area neighboring the pixel position of interest according to the K-th spectral characteristic and the L-th spectral characteristic;

~~a regression analysis step for~~ performing a regression analysis in ~~a~~ the plurality of pixel positions in ~~an~~ the area neighboring the ~~first~~ pixel position of interest, using the pixel signals or the low-pass filtered outputs having the K-th spectral characteristic as an explanatory variable,

and using the pixel signals or the low-pass filtered outputs having the L-th spectral characteristic as a purpose variable, to calculate a regression line,

$$y = a \cdot x + b \qquad \text{...(1)}$$

('y' being the pixel signal having the L-th spectral characteristic, 'x' being the pixel signals having the ~~L-th~~ K-th spectral characteristic, 'a' and 'b' being constants representing the slope and intercept of the regression line),

expressing a correlation of the pixel signals having the K-th spectral characteristic with the pixel signals having the L-th spectral characteristic; and

~~a calculating step for~~ determining the pixel signal having the L-th spectral characteristic at the ~~first~~ pixel position of interest by applying a conversion formula based on the regression line to the pixel signal having the K-th spectral characteristic at the ~~first~~ pixel position of interest; ~~and~~

wherein the selecting step ~~a selection step for~~ sequentially selects ~~ing~~ different ones of the arrayed pixels ~~as~~ for the pixel position of interest and, for each selected pixel position of interest, ~~using~~ applying the steps of performing the regression analysis ~~step~~ and ~~the calculating step to~~ determining ~~e~~ the pixel signal having the L-th spectral characteristic.

25. (Currently Amended) The pixel signal processing method of claim 24, wherein said pixel signals are associated with an imaging device with N types of photoelectric conversion elements, each having one of the first to N-th spectral characteristics, arrayed on a two-dimensional plane,

and wherein the method further comprises:

~~the selection step~~ determining ~~es~~ the K-th and L-th spectral characteristics in order of the strength of the correlation between their spectral characteristics.

26. (Currently Amended) The pixel signal processing method of claim 25, wherein:

each photoelectric conversion element has one of red (R), green (G), and blue (B) spectral characteristics; and

the following sequence of operations is performed: ~~selection step~~

first, ~~determines~~ the green pixel signals are determined as the L-th spectral characteristic at pixel positions where red pixel signals are present and ~~the green pixel signals at pixel positions~~ where blue pixel signals are present, respectively;

next, ~~the selection step determines~~ the red pixel signals are determined as the L-th spectral characteristic at pixel positions where green pixel signals are present, and the blue pixel signals are determined as the L-th spectral characteristic at pixel positions where green pixel signals are present; and

finally, ~~the selection step first determines~~ the blue pixel signals are determined as the L-th spectral characteristic at pixel positions where red pixel signals are present, and the red pixel signals are determined as the L-th spectral characteristic at pixel positions where blue pixel signals are present.

27. (New) The pixel signal processing apparatus of claim 21, wherein the regression analysis device is configured to:

determine for the pixel position of interest a direction of strong similarity with respect to the L-th spectral characteristics;

determine the pixel positions in the area neighboring the pixel position of interest with pixel signals having the K-th characteristic which are aligned in the direction of strong similarity; and

perform the regression analysis using the low-pass filter outputs of the determined pixel positions as the explanatory variable.

28. (New) The pixel signal processing apparatus of claim 21, wherein:

the low-pass filter corresponding to the K-th spectral characteristic is configured to process a particular pixel position by outputting a mean value of pixel signals having the K-th spectral characteristic within a predetermined area of the particular pixel position, and

the low-pass filter corresponding to the L-th spectral characteristic is configured to process the particular pixel position by outputting a mean value of the pixel signals having the L-th spectral characteristic within the predetermined area of the particular pixel position.

29. (New) The pixel signal processing method of claim 24, wherein performing the regression analysis device includes:

determining for the pixel position of interest a direction of strong similarity with respect to the L-th spectral characteristics;

determining the pixel positions in the area neighboring the pixel position of interest with pixel signals having the K-th characteristic which are aligned in the direction of strong similarity;

and

using the low-pass filter outputs of the determined pixel positions as the explanatory variable.

30. (New) The pixel signal processing method of claim 24, wherein:

the low-pass filtering step processes a particular pixel position by outputting a mean value of pixel signals having the K-th spectral characteristic within a predetermined area of the particular pixel position, and outputting a mean value of the pixel signals having the L-th spectral characteristic within the predetermined area of the particular pixel position.

31. (New) The pixel signal processing apparatus according to claim 21, wherein the low-pass filters obtains a low-pass filter output for the L-th spectral characteristic, for each of the pixel positions, by low-pass filtering of the pixel signals having the L-th spectral characteristic surrounding said each of the pixel positions, and obtains a low-pass filter output for the K-th spectral characteristic, for each of the pixel positions, by low-pass filtering of the pixel signals having the K-th spectral characteristic surrounding said each of the pixel positions.

32. (New) The pixel signal processing apparatus according to claim 21, wherein the low-pass filters obtains a low-pass filter output of the pixel signal having the L-th spectral characteristic at each of the pixel positions where there is a pixel signal having the K-th spectral characteristic by low-pass filtering of the pixel signals having the L-th spectral characteristic surrounding each of the pixel positions where there is a pixel signal having the K-th spectral characteristic among a

plurality of pixel positions in an area neighboring the pixel position of interest, and obtains a low-pass filter output of the pixel signal having the K-th spectral characteristic at each of the pixel positions where there is a pixel signal having the L-th spectral characteristic by low-pass filtering of the pixel signals having the K-th spectral characteristic surrounding each of the pixel positions where there is a pixel signal having the L-th spectral characteristic among a plurality of pixel positions in an area neighboring the pixel position of interest.

33. (New) The pixel signal processing apparatus of claim 22, wherein the low-pass filters perform low-pass filtering of an output of the imaging device.

34. (New) The pixel signal processing apparatus of claim 22, wherein the regression analysis device uses pixel signals output from the imaging device as the pixel signals having the K-th spectral characteristic.

35. (New) The pixel signal processing apparatus of claim 21, wherein the regression analysis device uses pixel signals obtained by interpolation as the pixel signals having the K-th spectral characteristic or the pixel signals having the L-th spectral characteristic.

36. (New) The pixel signal processing apparatus according to claim 24, wherein the low-pass filtering obtains a low-pass filter output for the L-th spectral characteristic, for each of the pixel positions, by low-pass filtering of the pixel signals having the L-th spectral characteristic surrounding said each of the pixel positions, and obtains a low-pass filter output for the K-th

spectral characteristic, for each of the pixel positions, by low-pass filtering of the pixel signals having the K-th spectral characteristic surrounding said each of the pixel positions.

37. (New) The pixel signal processing apparatus according to claim 24, wherein the low-pass filtering obtains a low-pass filter output of the pixel signal having the L-th spectral characteristic at each of the pixel positions where there is a pixel signal having the K-th spectral characteristic by low-pass filtering of the pixel signals having the L-th spectral characteristic surrounding each of the pixel positions where there is a pixel signal having the K-th spectral characteristic among a plurality of pixel positions in an area neighboring the pixel position of interest, and obtains a low-pass filter output of the pixel signal having the K-th spectral characteristic at each of the pixel positions where there is a pixel signal having the L-th spectral characteristic by low-pass filtering of the pixel signals having the K-th spectral characteristic surrounding each of the pixel positions where there is a pixel signal having the L-th spectral characteristic among a plurality of pixel positions in an area neighboring the pixel position of interest.

38. (New) The pixel signal processing apparatus of claim 25, wherein the low-pass filtering is performed on an output of the imaging device.

39. (New) The pixel signal processing apparatus of claim 25, wherein the regression analysis uses pixel signals output from the imaging device as the pixel signals having the K-th spectral characteristic.

40. (New) The pixel signal processing apparatus of claim 24, wherein the regression analysis uses pixel signals obtained by interpolation as the pixel signals having the K-th spectral characteristic or the pixel signals having the L-th spectral characteristic.